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SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE •

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No Brains

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The Weekly Summary of Current Science

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DO YOU KNOW?

Hospitals in the United States are increasing six times as fast as the population.

Cornstalk board will be used as insulating material in the roof of the new Post Office Department at Washington.

From the weather this spring, it is predicted that army worms will be flourishing in grain fields this summer.

A family garden of a quarter of an acre may produce more than $100 worth of vegetables.

A new government ruling sets a stringent limit on the amount of lead, used in insect sprays, that may be left on fruit entering interstate commerce.

A new invention is a jacket for a tube of tooth paste or cold cream which pushes up the contents from the bottom of the tube as wanted

There are almost nine million fewer horses and mules in the United States now than there were in 1920, which means that 40 million acres of land are no longer needed for growing feed.

The Oriental Institute in Chicago has acquired an astronomical instrument—a stellar clock—made "with his two hands" by Tutankhamen.

Road construction is so rarely mentioned in writings of the Middle Ages, that engineers believe it may have become almost a lost art.

A little 13-pound portable radio set, which can be used to send and receive voice messages, is being tried out by Forest Service workers.

In some regions stocked with deer, rattlesnakes have disappeared, due to the habit of the deer of jumping on a coiled snake and cutting it to pieces with its sharp hoofs.

A study of the physical condition of 100,000 men shows that the average business man has fewer defects than the professional man, farmer, or skilled trade worker.

The University of Kentucky and Kiwanis Clubs are establishing "listening centers" in the Kentucky mountains, where people can gather to listen to radio programs of educational value.

WITH THE SCIENCES THIS WEEK

ANTHROPOLOGY

Of what figures is the monument, "The Unity of Man," composed? p. 356. *The Races of Man*—A. C. Haddon—*Macmillan*, 1925, $2.50.

ARCHAEOLOGY

How many kings reigned in Assyria from 2200 to 722 B.C.? p. 361. *Mesopotamian Origins, The Basic Population of the Near East*—*Ephraim A. Speiser—Univ. of Penna.*, 1930, $3.

How many pieces of jewelry will be exhibited in Chicago by Mexican archaeologists? p. 357.

ASTRONOMY

Where does the night sky get its brightness? p. 357.

BIOGRAPHY

What is an Aristogenic record? p. 366. *Experience and Nature*—*John Dewey—Open Court*, 1926, $3.

BIOLOGY

What happens to flightless birds? p. 366.

Where do "M" rays come from? p. 361.

BOTANY

How does a wild rose move? p. 355.

ETHNOLOGY

Why is it hard to distinguish Jivaro men from their wives and sisters? p. 355.

GENERAL SCIENCE

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GEOLOGY

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What is the usual shape of a stalagmite? p. 361.

MEDICINE

Do people die of arthritis? p. 360.

PHYSICS

What substances did the American and Dutch physicists reduce almost to absolute zero temperature? p. 365.

Where does light prefer to create matter? p. 355.

POPULATION

Why will American industry have to readjust? p. 356. *Population Problems*—*Warren S. Thompson*—*McGraw-Hill*, 1930, $3.75.

PSYCHIATRY

When does constitutional schizophrenia develop? p. 365.

PSYCHOLOGY

How happy do college students consider themselves? p. 356.

How much should baby be amused? p. 358.

PUBLIC HEALTH

Why would cosmetics be brought under Federal control in the new pure food and drug bill? p. 360. *The History of a Crime Against the Food Law*—*Harvey W. Wiley*, 1929, $2.

These curiosity-arousing questions show at a glance the wide field of scientific activity from which this week's news comes. Book references in italic type are not sources of information of the article, but are reference for further reading. Books cited can be supplied by Book Dept., Science News Letter, at publishers' prices, prepaid in the United States.

PHYSICS

Matter Created Experimentally From Light and Cosmic Rays

Process Seems To Be Going on All the Time on Earth But No Bulk Substance, Only Electrons, Are Formed

TANGIBLE matter is being created out of light and cosmic rays which come to earth from outer space. Radiation produced here on earth is also manufacturing in some proved instances matter out of intangible waves.

Conversion of mass of the stars to produce light and heat has been the favorite method of explaining their long life. That has been the classic example of the interchange of matter and radiation.

Evidence Accumulating

Now evidence is accumulating for the reverse process, the creation of matter out of radiation, not in the far-distant stars, but here on earth.

The idea that matter is created by light or photons was put forth by Dr. P. M. S. Blackett and G. Occhialini of Cambridge's Cavendish Laboratory, in England. The light prefers to perform this miracle only in the neighborhood of an atomic nucleus. The matter is created in the form of a pair of electrons, one positive and one negative.

These Cambridge physicists formulated their theory on the basis of Dr. Carl D. Anderson's discovery of the positive electron and their own subsequent confirming researches.

Experimental evidence for the creation of matter is contained in the bursts of electrons due to cosmic rays observed by Dr. Anderson in his apparatus located at the California Institute of Technology. And Dr. Anderson recently found pairs of electrons formed by the gamma rays given off by thorium. The positrons or positive electrons so formed do not live long, however, since they unite with negatives to form photons or light again.

Dirac's Equation Substantiated

The latest development is that Dr. J. P. Oppenheimer of the California Institute of Technology and Dr. Milton Plesset, a National Research fellow, have found that the theoretical equation of Dr. P. A. M. Dirac is quite in accord with the facts. This had led to important predictions bearing on cosmic rays.

Photons of high energy much prefer to produce the pair of electrons than to transfer their energy to a single ordinary electron. All of the photons or cosmic rays are equally effective in producing new pairs.

After discussing these new developments with Pasadena scientists, Dr. Niels Bohr, the Danish physicist who is spending some weeks at the California Institute of Technology, commented that the calculations by Drs. Oppenheimer and Plesset have convinced him that the Dirac equation instead of being false is the greatest acquisition to human knowledge in the past few years.

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BOTANY

Plant Parts Move as Decisively as Fingers

STRANGE, how hard traditions die. The distinction between animals as "moving" and plants as "non-moving" is at least as old as Aristotle: and like many other things in Aristotle, more at home in logic than in actual fact. True, most plants do not go galloping around over the landscape like the animals that prey on them, but they do have the power of movement nevertheless. The five sepals of the rose, for example, are closed up tight around the bud, like the five fingers of a man's hand guarding a precious jewel; but when the flower is ready they fold back as decisively as fingers making a generous offering. This action is strikingly shown in the Cornelia Clarke photograph reproduced on this page, of a wild rose that has already shed its petals, between buds as yet unopened.

BUT PLANTS DO MOVE

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ETHNOLOGY

World's Fiercest Fighters Called "Ladylike" Men

HERE is a paradox discovered by science. Some of the world's most bloodthirsty fighters, Jivaro head-hunters, are so "ladylike" that it is hard for a stranger to distinguish these men from their wives and sisters.

Jivaro men wear long hair and skirts, says Matthew W. Stirling, chief of the Bureau of American Ethnology, who studied the Jivaro Indians down in their homeland jungles in Peru and Ecuador.

Jivaro warriors paint their faces in feminine fashion, and speak softly.

Most Indians have nearly hairless bodies and smooth muscles, but these characteristics are exaggerated among the Jivaros. Among the class of young men who become warriors, feminine characteristics are especially pronounced.

Mr. Stirling, who reported this neglected angle of Jivaro ethnology before the American Psychopathological Association, said that there is a sort of

"femininity" in the atmosphere of a head-hunter community. When he visited the Jivaros, he had at first the vague, subconscious sensation of living in a woman's world. This strangeness did not wear off for several days.

Early Spanish and Portuguese explorers who caught glimpses of the Jivaros must have thought that the warriors were women. That accounts for their naming the Amazon River, under the mistaken idea that these Indians were women warriors, like the famous Greek Amazons.

The ladylike dress and manner of the Jivaro head-hunter, like his head-hunting proclivities, are long-established customs. There is nothing "sissy" about the Jivaro male beyond his appearance, says the ethnologist.

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POPULATION

Industry Must Adjust Itself To Country's Slowing Growth

New Study Points to 17,000,000 Increase of Past Decade, 10,000,000 Present and Smaller Increments For Future

AMERICA is slowing down in her mad pace of increasing numbers.

In the year 1860 the population of the United States was eight times as great as it was in 1790, 70 years earlier. In 1930 it was four times as large as in 1860, also 70 years earlier. But in 2000 it will not be even twice the 1930 figure.

A million a year. That is the estimate of population growth just issued by two students of the statistics of population, Dr. Warren S. Thompson, director of the Scripps Foundation for Research in Population Problems and his associate, P. K. Whelpton. (McGraw-Hill)

Industry will need to adjust itself to this slower space, it is pointed out.

"Clearly an increase of 10,000,000 persons from 1930 to 1940 will demand less new housing than did the increase of 17,000,000 from 1920 to 1930. Also the smaller increase will require fewer new schools, factories, stores, and offices."

Industries will feel the effects of an approaching stationary population in proportion to the degree that they have a stable product or have already reached the saturation point.

"It is hard to conceive that the average family would use two radios or two kitchen stoves, for example; but the present radio may be replaced by an improved model at any time, while the kitchen stove is likely to be kept until worn out," the investigators indicate. And demand for necessities of life such as food, clothing, and shelter will expand less rapidly with rising incomes than demand for conveniences and luxuries.

But there are other industries, and these probably produce the majority of all industrial goods, that are relatively independent of population growth. They could sell their products in increasing quantities and improving qualities, regardless of population increase, if only the public had the money to buy.

To these industries, the raising of the per capita purchasing power of the public will be an ever-increasing concern.

Another industrial problem is foreseen by the investigators in the decrease in size of family and the consequent increase in opportunity for savings by the heads of families. Since savings, in general, are invested in some form of business enterprise, capital may be increasing most rapidly at just the time when the number of persons for whom necessities must be provided has been increasing most slowly.

"In this manner the decline in the birth rate has contributed directly to the lack of balance in the industrial system which is in part responsible for the present troubles.

"It is not the intention of the authors to suggest that slower population growth has brought on the present depression; although the decline in annual growth since 1923 may have been a contributory factor. But because 'business as usual' has been predicated to such a large extent on a rapidly growing population in the past, it is reasonable to urge that the change in the rate of population growth now going on, and to be expected in the future, be given careful consideration in planning for the rationalization of social and economic life."

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PSYCHOLOGY

Cause of Happiness Sought By Psychologist

HOW CAN WE find happiness? This question, about which philosophers have speculated for ages, is now receiving scientific study by psychologists. Happy and unhappy college students have served as subjects for tests reported by Dr. George W. Hartmann of the Pennsylvania State College, to the Association of Consulting Psychologists.

Emotional stability, or a lack of neurotic tendency, is the most important single factor leading to happiness, he found. Nevertheless, enthusiastic mental hygienists will be disappointed in the finding that emotional health is far from the sole producer of happiness.

"The dominant individual apparently has slightly greater chances of being happy than the submissive person, a finding which is hardly comforting to an advocate of traditional Christian ethics," Dr. Hartmann said.

The "rugged individualist" is no more likely to be happy than the "clinging vine"—another upset to common opinion.

The ideal of the individual seems to have no relation to the extent of his happiness. No indication was found that adherence to orthodox religious beliefs makes for greater happiness.

No connection was found between intelligence and happiness, not even the inverse relation that some cynics have claimed. And neither high or low interest in the career being trained for, appears to be related to happiness.

Most of these college students studied consider themselves happier than the average, but Dr. Hartmann suggests that perhaps the average man considers himself also happier than average.

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ANTHROPOLOGY

Racial Hall of Fame Opened In Field Museum

THE FINEST racial portraiture that the world has yet seen.

This is the high praise bestowed by Sir Arthur Keith, eminent British anthropologist, on the new gallery of bronze statues which has just been opened at the Field Museum, Chicago. The hall is known as Chauncey Keep Memorial Hall, in honor of a former trustee of the Museum.

The bronzes, representing the world's

WHITE, BLACK, YELLOW

peoples from the highest to the most primitive types, are the work of Malvina Hoffman. To seek living models who would represent little known tribes, Miss Hoffman traveled around the world.

The sculptor caught many of her subjects in lifelike poses. A bronze Hawaiian balances lightly on his surfboard. A native of the Australian bush stands poised to hurl his death-dealing spear. A lady of India shows the reserve of her class and culture. And farther on is an "untouchable" old woman of India, in sharp contrast. Some of the human types hunted out and modeled for this anthropological collection are said to be on the verge of extinction.

One monument, entitled "The Unity of Man," expresses the idea of man as a well-defined, fundamentally uniform species which has spread over the earth. It portrays in bronze three human types, white, yellow, and black, each man representing the highest physical development of his race. Each carries his weapons: the white man a sword, the yellow man bow and arrows, the black man a spear and shield. The pillar which the men encircle is topped by a globe.

ASTRONOMY

Contents of "Empty Space" Revealed by Colors of Nebulae

Yerkes Studies Indicate That So-Called Void Contains Particles of All Sizes, Some as Large as Speck of Dust

"AS EMPTY as interstellar space," is a comparison that needs revision as a result of recent researches made at Yerkes Observatory, Williams Bay, Wis. For the gigantic voids between the stars that shine in the night sky are not truly empty. They are filled with an extremely tenuous cloud of fog, which contains so close to nothing that it would be pronounced perfect as a vacuum by a physicist if it were here on earth.

Astronomers know that there is something in the space that seems to be empty because the light of distant stars is dimmed and reddened in its passage through space. This was shown by Dr. R. J. Trumpler of the Lick Observatory as well as by observations made with the Yerkes 40-inch telescope. Distant stars appear somewhat more ruddy than the ones nearer to us. This suggests to the astronomers that interstellar space has an effect like that of the atmosphere of the earth upon the sun's rays. When the sun is near the horizon its rays look red because they must travel through a thick layer of air.

But do not suppose for a moment that the light that is scattered by the air is lost, for it is not. The light subtracted to make the redness of the sunlight reappears as the blue of the sky. The compensation is so exact that it can be figured out theoretically.

Applying a like reasoning to interstellar space and its particles, Dr. Otto Struve, director of the Yerkes Observatory, considered what effect the space reddening of the starlight should have on the space surrounding the stars. It would cause a faint general illumination of space, a slightly radiant screen of the heavens upon which are projected the more luminous images themselves. Dr. Struve computed just how much this background illumination should be expected to contain. The result surprised him.

The total amount of light produced by space should be greater than that of all the stars combined and the color of this general illumination should be as blue as the bluest daylight of the sky. That the night sky is actually bright and not dark can be easily proved by any observer situated far from city lights. When the eyes are sufficiently adjusted to the dark, the sky appears faintly luminous between the stars and the outlines of nearby objects, such as trees or houses, can be easily perceived.

In certain regions of space, near luminous stars, the interstellar fog may be illuminated so much that these regions appear even brighter than the rest of the sky. This would especially be true if a local condensation in the interstellar fog happens to be near a bright star. It can then be photographed with a telescope because of its great luminosity and it is seen projected as a bright spot upon the faint general sky illumination.

Such spots are called nebulae. The composition of these nebulae is not fully understood. Some of them scatter the light of the stars and their luminosity is therefore due to reflected or scattered star-light. (*Turn to Page* 364)

ARCHAEOLOGY

Exposition to Show Monte Alban Jewels

ONE OF Mexico's most treasured archaeological possessions, the famous collection of Indian jewels from the treasure tomb at Monte Alban, will arrive for exhibit at the Century of Progress fair, June 20.

The jewels, property of the Mexican government, will be displayed in a car of the Mexican Presidential train. There are more than 500 pieces of ancient Indian jewelry in the collection.

The tomb was discovered last year by Dr. Alfonso Caso, Mexican government archaeologist, in the mountains of the state of Oaxaca. Splendors of this prehistoric American tomb have been compared with the contents of Tutankhamen's tomb in Egypt.

PSYCHOLOGY

Break a Habit by Practicing It

Thumb-Sucking, Typist's Errors, and Poor Golf Shots Cured by Intentionally Repeating Them, Psychologist Finds

By MARJORIE VAN de WATER

PRACTICE makes perfect.

This saying, which used to be written and tediously re-written in copybooks, has now been given an entirely new interpretation by a psychologist who has developed a novel theory of learning and habit formation.

Practice may make for perfection, says Dr. Knight Dunlap, of Johns Hopkins University, but not necessarily perfection in the thing practiced.

The human mind works in a paradoxical fashion in learning, he has found. The boy can best improve his handwriting not by "practicing" the perfect copy as the teacher has placed it on the blackboard, but by concentrating on his own natural errors.

Bad habits can be broken by deliberately practicing them at definite times and under proper supervision. Stutterers can be cured by having them consciously and deliberately imitate their own faulty speech. Typists can eliminate persistant transpositions of letters by "practicing" the error. And the best memory system is to try to forget.

These are just a few of the new ideas expressed by Dr. Dunlap in his book on Habits; Their Making and Unmaking (Liveright). They do not fit in with the older theories of learning by association or repetition. They will undoubtedly be disputed by some psychologists and by some laymen.

But they do fit in with the commonsense observations of the "contrary" nature of humans.

"It is true," Dr. Dunlap says, "that some habits are apparently formed by repetition. By repeated smoking, we form the smoking habit. By repeatedly speaking in a certain way, we may acquire the habit of speaking in that way. But it becomes more and more clear that in many cases the habit of acting in one way is really formed by acting in another way."

So, while you are learning a skill you may be practicing a gradually improving set of unskillful, or "wrong" movements. As an example Dr. Dunlap cites the person who is learning to drive an automobile.

"Day by day the type of performance changes; that is the indication that one is really learning. If the process goes far enough, a fixed or stereotyped performance may be reached. But learning has occurred even if the process be discontinued before that point. In learning to drive an automobile, certain minor operations of control of pedals and gear shift become stereotyped; but the proof of most efficient learning is found when one reacts properly in an emergency which has never before been presented, in which the appropriate reaction has been truly learned."

There is another old saying—that we learn through our mistakes. This has received scientific confirmation in Dr. Dunlap's findings. While the bride is learning to cook, her methods and results are different from her later attainments. Yet the learning proceeds.

Skill from Dub Shots

And so it is too with the golf player, the tennis pupil, and the man learing to swim. You don't begin your learning with your first perfect stroke. By that time you have already accumulated considerable skill through the process of practicing dub shots.

Then, too, you may learn one thing by practicing something entirely different. The accomplished musician may be able to play on sight the piece of music you put before him. The work is quite new to him, he has never seen it before, yet he has learned it through practicing many other pieces by other composers.

And there is still another way by which you can learn one thing by doing another—you can assist yourself in learning a skill by thinking about it and planning in your mind how you will make your movements. Dr. Dunlap says:

"The billiard pupil profits immensely by having the theory of shots explained to him. His thinking is really a response or series of responses, but it is a response of a type different from that of making a shot. So also, the man learning to dive makes progress through planning, or thinking of the proper performance before attempting it.

"Actually, such combinations of thinking and perceptual response in 'motor' learning are not exceptional. In almost all learning processes thought is an important factor, and in many learning processes it is the essential factor.

"Learning, then, proceeds through responses, which may or may not be similar in type to the responses which are ultimately learned."

Dr. Dunlap does not, however, hold that a general "training" of the mind will aid you in learning particular skills or school subjects.

" 'General training,' like the 'average rat' is a fiction," he says. Experimental work on learning has shown that the results of practice in any line are most conspicuously demonstrated in that very line. Conversely, to obtain the best training in any line, one must study that line if possible.

"One best learns mathematics by studying mathematics, not Greek. One best learns German by studying German, not French. One best learns tennis by practicing tennis, not golf . . .Hence the primary basis for the selection of subjects for study today is the need for, or advantage of, knowledge or skill in these subjects."

In this Dr. Dunlap disagrees with those who have urged the study of the classics, especially Latin and Greek, on the ground that they train the mind and fit it to deal more efficiently with other matters, much as gymnastics might fit the body for other physical tasks.

He does not, however, hold that there is no transfer of learning from one sub-

DR. KNIGHT DUNLAP

—Professor of Experimental Psychology at Johns Hopkins University, sets forth a new theory of learning and habit formation.

ject to another. He points out the need of further experimental study of this problem. It may be that learning a poem will help you later when you want to memorize a shopping list, but then again it may hinder you. Psychologists cannot at present tell you.

They do know that when a rat learns to find his way through one maze it interferes with his learning of another. But the minds of human beings are not so easily studied as are those of rats, and neither are their actions so consistent.

These views on the effects of practice in learning, while they are new, are not so revolutionary as what Dr. Dunlap has to say about forgetting, or un-learning, or the breaking of habits.

He has introduced a new term into psychological literature—"negative practice." An undesirable habit can be broken, he says, by "negative practice."

Among the habits which can be broken in this way are those known to psychologists as "tics." If you look about your family and friends you can observe any number of these annoying habits sometimes known as mannerisms. It may be pulling at a moustache, twisting of the face, sucking at a tooth, jingling the coins in trousers pockets, rumpling of the hair, beating a tattoo with the finger tips, or biting the hair or fingernails, or thumb-sucking.

It is easy to see them in your friends, but not so easy to see them in yourself. For they are usually completely automatic, and often unconscious.

"Thumb-sucking is an infant habit which is especially pernicious, for although it disappears in later childhood, it is a difficult habit to break during the first few years of life, and many of the methods and appliances which have been applied in the attempt to "cure" the habit produce other bad effects. The thumb-sucking is indeed a symptom of a basal condition which is theoretically easy to adjust, but which, for economic reasons, is often practically difficult.

"Thumb-sucking is in almost every case the result of bad social treatment of the child during the first year of life. It is a sign that the child has been not adequately socially stimulated. The child which is handled in the way which has been recommended by some influential physicians is especially apt to become a thumb-sucker.

"This method, which has sometimes been called 'scientific' is systematic neglect of the child, camouflaged under the guise of 'science' to relieve the parent's feeling of guilt. . . .

"The baby which is neglected does in the course of time adjust itself to its unfortunate environment. Such babies become 'good' babies, and progressively easier to neglect. Such procedure is no more justified by these results than is the method of keeping the baby mildly drugged.

"The baby should not be allowed to cry, or rather crying should be minimized, and never allowed to continue long.

Play With the Baby

"The baby should be allowed to amuse itself only for short and carefully controlled periods. It should be amused during practically all of its waking time.

"So far as possible a baby, or a child of any age, should be prevented from lying in bed awake.

"Of course, keeping the baby happily stimulated during its waking periods, and preventing crying, while not 'spoiling' the child, is a difficult task, too difficult, perhaps, for the intelligence of many parents. Spoiling a child, however, is a minor evil; neglecting it is a major one."

As soon as they are old enough to really want to stop the evil habit—and Dr. Dunlap has had good success with five-year-olds—thumb-sucking children can be cured by daily practice of sucking the thumb.

Success of the same sort has been obtained with nail-biters even when the habit has persisted into the college years.

Nail-biting is often so savage that no one would have the heart to prescribe biting of nails to quite the extent that is done in the involuntary habit.

Every Case Cured

In treating it, therefore, Dr. Dunlap merely directed biting the nails in two daily ten-minute periods without stressing the need to make it as savage as the involuntary habit. Yet the biting habit was broken in every case.

The same treatment has been successful in breaking up many different kinds of undesirable social and personal habits, including even bad sex habits, but the latter should be treated only under the direction of a psychologist.

This idea of negative practice is also involved in learning and remembering, and Dr. Dunlap has developed some new rules to be followed by those who wish to "improve their memories."

In the first place, he says, the volume of material memorized does not of itself increase the ability to memorize. In fact, burdening of the mind with all sorts of unnecessary material is really a handicap in the learning of what is useful.

It is actually profitable not to remember some things. For example, Dr. Dunlap points out that your enjoyment of movies and books would be considerably greater if you did not remember the plot and details of previous pictures or novels. It is necessary to make a wise selection of what you really want to know, and in this you should be guided by your vocational and avocational interests.

Most persons have no need to know large numbers of telephone numbers, or the spelling of difficult and unusual words, or the dates of historical events. You can always provide yourself with a directory, dictionary, and other reference books, and remember only where to find the information.

Neither should you remember things longer than they are useful. Having in your mind the number of last year's license tag for your automobile is just a nuisance if this year's number is different.

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A three-ton hippopotamus is considered a big fellow, but one hippo in the London Zoo tipped the beam at four tons.

PHYSIOLOGY

Clotted Blood Forms Capillary-Like Tubes

VESSELS resembling the minute capillaries through which the blood passes from veins to arteries in the body are formed in masses of blood allowed to coagulate outside the body. Their formation has been observed by Dr. Raymond C. Parker of the Rockefeller Institute for Medical Research.

The tubules are not formed by any "vital" activity of the living cells of the blood, but on the contrary the initiative is taken by purely physical forces in the blood fluid, Dr. Parker explains in the current issue of *Science*, where he describes the phenomenon in detail. After the courses of the tubules have been outlined by currents streaming through the slowly solidifying mass, certain cells around them weave the walls, partly out of their own bodies and partly from fine hair-like processes which they put out.

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PUBLIC HEALTH

New Pure Food Bill Greatly Extends Regulation

AT THE DIRECTION of President Roosevelt, Secretary of Agriculture Wallace has sent a draft of proposed legislation for a new national pure food and drug law to Congress.

The limitations of the present law make it impossible to carry out its intention of protecting the public from impure or harmful foods and drugs, Secretary Wallace pointed out in submitting the new bill.

Under the new bill, the Secretary is authorized to set definitions and standards of purity for foods, just as there are now legal standards for official drugs. Under the present law such standards may be set for canned foods only.

False advertising is to be prevented under the new bill. At present there is no way under the Food and Drugs Act to control the serious abuses in this particular field.

The present law prohibits false or misleading statements on the labels of foods and drugs, but under the new bill, labels must tell enough about the product so that the consumer will know what he is getting and can buy intelligently and discriminatingly.

Cosmetics are to be brought under federal control so as to prevent the serious injuries that have occurred through the sale and use of harmful cosmetic products.

Another important feature of the bill is the provision directed at the sale of drugs labeled as treatments for various diseases. The Food and Drug Administration under the new bill will be able to prevent the sale of such drug products if the claims for them are contrary to general agreement of medical opinion. At present an influenza cure, for example, which physicians agree will not remedy influenza cannot be kept off the market unless the Food and Drug Administration can prove that the claims for the remedy are not only false but made with the intention of deceiving the public.

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MEDICINE

Optimism Best Aid Against Rheumatoid Arthritis

A CHEERFUL optimistic temperament is a great asset for the patient fighting rheumatoid arthritis, Dr. Russell L. Cecil of New York City said in a discussion of the prognosis in chronic arthritis before the American Clinical and Climatological Association.

The prospects of recovery from chronic arthritis, sometimes popularly known as rheumatism, depend primarily on the type of arthritis from which the patient is suffering, Dr. Cecil stated.

In the case of osteo-arthritis, the characteristic degenerative changes are permanent and tend to progress slowly. The symptoms resulting from these changes, however, can usually be ameliorated or entirely cleared up by proper treatment.

"The disease never menaces life," Dr. Cecil stated, "but the danger of serious deformity and crippling always exists, especially in neglected cases."

It is in this type of arthritis that the cheerful, optimistic temperament was said to be a great asset. Young people respond to treatment better than elderly patients. Those who have an acute onset seem to have a better chance than those whose symptoms come on insidiously. Much depends on the joints involved, the knees, the hips and back offering the greatest difficulty.

Finally, the ability and the disposition of the patient to devote himself zealously to the regime and treatment prescribed by his physician is of the greatest importance in forecasting the chances of recovery.

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IN SCIE

GEOLOGY

Burning Mountain To Be Extinguished

CARBON Mountain in Colorado, which has figured largely in the news during recent months because of the great landslips caused by the burning of buried coal seams, is to have its fires put out as part of the President's emergency conservation work. A 200-man camp is to be established in Wyoming, and an attack will be made on a large number of fires in coal deposits, some of which have been eating away at our natural resources for years.

It is estimated that 28 known coal fires in the West can be extinguished for $500,000. On a royalty basis of fifteen cents a ton, these deposits are worth $63,000,000 to the government.

Science News Letter, June 10, 1933

PHYSICS

Gamma Rays Considered Cause of Positrons

THE NEUTRON'S discoverer, Dr. James Chadwick of Cambridge, delivering the Bakerian lecture of the Royal Society in London, awarded a tentative decision against the neutron as the cause of formation of the positron, another newly discovered particle of matter, when radiations from radioactive beryllium pass through a lead plate.

The radiation from beryllium consists of neutrons and gamma rays. The neutron can be thought of as a corpuscle, but gamma rays are like light, X-rays and radio waves in being electromagnetic waves. Positrons or free positive electrons are produced by atom smashing when the mixed beryllium radiation is allowed to attack lead. The neutrons were accused at first, but now Dr. Chadwick believes that the gamma rays, not the neutrons, may be responsible.

Out of 300 electron tracks produced, 200 were made by the familiar negative electrons, while 70 were positive. Dr. Chadwick's work agrees generally with researches by Dr. Carl D. Anderson of California.

Science News Letter, June 10, 1933

EE FIELDS

BOTANY

Temperate Zone Fruits To Be Raised in Tropics

A TEN-YEAR research program, aiming among other things at the adaptation of temperate-zone fruits and other plants to cultivation in the tropics, has been undertaken by the New York Botanical Garden. This was announced by Dr. G. Proctor Cooper, upon his arrival in Miami, Fla., on the schooner *White Cloud*, on which he and a group of his colleagues have just completed a seven-months' cruise.

A grant of land has been placed at the disposal of the New York Botanical Garden on Dominica, one of the Leeward Islands. Here for the next decade, botanists will conduct their researches each year from autumn to spring.

The expedition brought back five hundred valuable botanical specimens, which will be added to the collection in New York.

Members reported interesting experiences in various parts of the Caribbean. On the San Blas coast of Panama, where the famous "white Indians" are found, they traded old shirts for native spears. The inhabitants of Margarita Island, off Venezuela, they found loaded with ornaments made of pearls.

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ARCHAEOLOGY

Newly-Found Tablet Names Unknown Kings

THE HISTORY of ancient Assyria has been pushed back into the unknown and filled out by the discovery at Khorsabad, fifteen miles north of Nineveh, of a tablet containing the names of ninety-three early kings, it was revealed in an announcement by Dr. James H. Breasted, director of the Oriental Institute of the University of Chicago.

The tablet was unearthed by the Khorsabad division of the Iraq expedition of the Institute. Excavations which were made in the palace of Sargon the Second also resulted in the important discovery of a temple of Nabu.

"But of still greater importance," Dr. Breasted declared, "is the royal list which is written in cuneiform on two sides of a large baked clay tablet and contains the names of ninety-three kings of ancient Assyria."

It was explained that the earliest names of Assyrian kings heretofore known, such as Ushpia and Kikia who ruled not long before 2000 B.C., have been completely detached from the known period of Assyrian history. The new Khorsabad list, however, furnishes eight new kings in unbroken succession preceding Ushpia and then continues down into historical times.

The entire list of ninety-three reigns covers a period of thirteen or fourteen hundred years, Dr. Breasted explained, from a century or two back of 2000 B.C. through the entire second millenium and ends in the eighth century down toward the reign of Sargon the Second, which began in 722 B.C. The list thus begins at possibly 2200 B.C. and ends around 730 B.C.

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BIOLOGY

M-Rays Affect Full-Grown As Well As Young Cells

FULL-GROWN cells no longer capable of dividing are susceptible to the influence of the mitogenetic rays, or "M-rays" given off by actively growing tissues, which have for some years been studied as a source of stimulation to the division process of young cells. So states Dr. H. Kowarzyk of the University of Krakow, Poland, who has tested the effect of this strange radiation on the activities of one class of white blood corpuscles, the leucocytes, that destroy bacteria and other foreign bodies.

Dr. Kowarzyk isolated a quantity of leucocytes from human, horse and rabbit blood, and exposed them to the action of M-rays from actively growing turnip tissues. Different samples of the irradiated leucocytes were given various species of bacteria to attack, including those of typhoid fever, blood poisoning, boils and the common colon bacillus. The leucocytes of human and rabbit blood suffered a depression of their ability to destroy the bacteria; those of the horse were stimulated.

Dr. Kowarzyk therefore regards the M-rays as effective upon mature, non-dividing cells, and not as specific stimulators for the process of cell-division.

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PHILOSOPHY

Bohr Classifies Truths and Opposites

SCIENCE may be defined as the field of activity where preconceptions can definitely be shown to have a limited applicability.

This statement is a typical example of the penetration and of the difficulty of remarks made by Prof. Niels Bohr, the Danish physicist, in a series of lectures before the California Institute of Technology, at Pasadena.

He classifies truths into trivialities, the opposites of which are obviously wrong, and wisdom, the opposites of which are sensible. Both are important. To renounce preconceptions always brings ample reward in the ever-widening field which we can thereby come to explore.

However, no matter how flexible we are, Prof. Bohr said, our experiences are always interpreted in terms of preconceived notions. The best we can do is to learn where these notions cease to help. In this way we make progress even though we inevitably return to our starting point.

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GEOLOGY

Brainlike Stalagmites Found in Maryland Cave

See Front Cover

STALAGMITE deposits shaped like human brains have been found on the floor of a newly discovered cave in Mount Etna, near Beaver Creek, Md., about sixty miles from Washington. James H. Benn of the Smithsonian Institution staff, who was detailed to make a geological investigation, brought one of them back with him for the U. S. National Museum collections.

The curious brain-like convolutions on the surface of the stone were formed by a double process, Mr. Benn explained. First the lime-charged drip of water from the roof formed rounded, smooth-surfaced deposits on the floor of the cave. Then the character of the water changed, and it lost its high lime content. After that it ceased to deposit lime on the stalagmitic masses, and instead began to dissolve away the lime already there, gradually wearing meandering channels that took on a striking resemblance to the furrows on the human cerebrum.

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MEDICINE

Laughing Gas

"A Classic of Science"

Davy Proved Nitrous Oxide Harmless Anesthetic, Using Famous Poets and Scientists as Experimental Animals

THE COLLECTED WORKS OF SIR HUMPHRY DAVY, Edited by his brother, John Davy. Vol. III. Researches, Chiefly Concerning Nitrous Oxide. (*First published in* 1800). *London: Smith, Elder and Co. Cornhill.* 1839. *This is an exact reprint of extracts from the original publication.*

A SHORT TIME after I began the study of Chemistry, in March 1798, my attention was directed to the dephlogisticated nitrous gas of Priestley, by Dr. Mitchill's Theory of Contagion.*

The fallacy of this theory was soon demonstrated, by a few coarse experiments made on small quantities of the gas procured from zinc and diluted nitrous acid. Wounds were exposed to its action, the bodies of animals were immersed in it without injury; and I breathed it mingled in small quantities with common air, without remarkable effects. An inability to procure it in sufficient quantities, prevented me at this time from pursuing the experiments to any greater extent. I communicated an account of them to Dr. Beddoes.

In 1799, my situation in the Medical Pneumatic Institution, made it my duty to investigate the physiological effects of the aëriform fluids, the properties of which presented a chance of useful agency. At this period I recommenced the investigation.

A considerable time elapsed before I was able to procure the gas in a state of purity, and my first experiments were made on the mixtures of nitrous oxide, nitrogen and nitrous gas, which are produced during metallic solutions.

In the beginning of March, I prepared a large quantity of impure nitrous oxide from the nitrous solution of zinc. Of this I often breathed the quantities of a quart and two quarts generally mingled with more than equal parts of oxygen or common air. In the most decisive of those trials, its effects appeared to be depressing, and I imagined that it produced a tendency to fainting: the pulse was certainly rendered slower under its operation.

At this time, Mr. Southey respired it in an highly diluted state; it occasioned a slight degree of giddiness, and considerably diminished the quickness of his pulse.

Mr. C. Coates likewise respired it highly diluted, with similar effects.

In April, I obtained nitrous oxide in a state of purity and ascertained many of its chemical properties. Reflections upon these properties and upon the former trials, made me resolve to endeavour to inspire it in its pure form, for I saw no other way in which its respirability or powers could be determined.

I was aware of the danger of this experiment. It certainly would never have been made if the hypothesis of Dr. Mitchill had in the least influenced my mind. I thought that the effects might be possibly depressing and painful, but there were many reasons which induced me to believe that a single inspiration of a gas apparently possessing no immediate action on the irritable fibre, could neither destroy nor immediately injure the powers of life.

On April 11th, I made the first inspiration of pure nitrous oxide; it passed into the bronchia without stimulating the glottis, and produced no uneasy feeling in the lungs.

The result of this experiment proved that the gas was respirable, and induced me to believe that a farther trial of its effects might be made without danger.

On April 16th, Dr. Kinglake being accidentally present, I breathed three quarts of nitrous oxide from and into a silk bag for more than half a minute, without previously closing my nose or exhausting my lungs.

SIR HUMPHRY DAVY, 1778-1829

The first inspirations occasioned a slight degree of giddiness. This was succeeded by an uncommon sense of fullness of the head, accompanied with loss of distinct sensation and voluntary power, a feeling analogous to that produced in the first stage of intoxication; but unattended by pleasurable sensation. Dr. Kinglake, who felt my pulse, informed me that it was rendered quicker and fuller.

This trial did not satisfy me with regard to its powers; comparing it with the former ones I was unable to determine whether the operation was stimulant or depressing.

I communicated the result to Dr. Beddoes; and on April the 17th, he was present, when the following experiment was made.

Having previously closed my nostrils and exhausted my lungs, I breathed four quarts of nitrous oxide from and into a silk bag. The first feelings were similar to those produced in the last experiment; but in less than half a minute, the respiration being continued, they diminished gradually, and were succeeded by a sensation analogous to gentle pressure on all the muscles, attended by a highly pleasurable thrilling, particular-

*Dr. Mitchill attempted to prove from some phenomenon connected with contagious diseases, that dephlogisticated nitrous gas which he called oxide of septon, was the principle of contagion, and capable of producing the most terrible effects when respired by animals in the minutest quantities, or even when applied to the skin or muscular fibre.

ly in the chest and the extremities. The objects around me became dazzling and my hearing more acute. Towards the last inspirations, the thrilling increased, the sense of muscular power became greater, and at last an irresistible propensity to action was indulged in; I recollect but indistinctly what followed; I know that my motions were various and violent.

These effects very soon ceased after respiration. In ten minutes, I had recovered my natural state of mind. The thrilling in the extremities, continued longer than the other sensations.

This experiment was made in the morning; no languor or exhaustion was consequent, my feelings throughout the day were as usual, and I passed the night in undisturbed repose.

The next morning the recollections of the effects of the gas were very indistinct, and had not remarks written immediately after the experiment recalled them to my mind, I should have even doubted of their reality. I was willing indeed to attribute some of the strong emotion to the enthusiasm, which I supposed must have been necessarily connected with the perception of agreeable feelings, when I was prepared to experience painful sensations. Two experiments, however, made in the course of this day, with scepticism, convinced me that the effects were solely owing to the specific operation of the gas. . . .

Removed Pain

At the end of July, I left off my habitual course of respiration; but I continued occasionally to breathe the gas, either for the sake of enjoyment, or with a view of ascertaining its operation under particular circumstances.

In one instance, when I had headache from indigestion it was immeddiately removed by the effects of a large dose of gas; though it afterwards returned, but with much less violence. In a second instance, a slighter degree of head-ache was wholly removed by two doses of gas.

The power of the immediate operation of the gas in removing intense physical pain, I had a very good opportunity of ascertaining.

In cutting one of the unlucky teeth called dentes sapientiae, I experienced an extensive inflammation of the gum, accompanied with great pain, which equally destroyed the power of repose, and of consistent action.

On the day when the inflammation was most troublesome, I breathed three large doses of nitrous oxide. The pain always diminished after the first four or five inspirations; the thrilling came on as usual, and uneasiness was for a few minutes swallowed up in pleasure. As the former state of mind however returned, the state of organ returned with it; and I once imagined that the pain was more severe after the experiment than before. . . .

Detail of Mr. Coleridge

The first time I inspired the nitrous oxide, I felt a highly pleasurable sensation of warmth over my whole frame, resembling that which I remember once to have experienced after returning from a walk in the snow into a warm room. The only motion which I felt inclined to make, was that of laughing at those who were looking at me. My eyes felt distended, and towards the last, my heart beat as if it were leaping up and down. On removing the mouth-piece, the whole sensation went off almost instantly.

The second time I felt the same pleasurable sensation of warmth, but not, I think, in quite so great a degree. I wished to know what effect it would have on my impressions; I fixed my eye on some trees in the distance, but I did not find any other effect except that they became dimmer and dimmer, and looked at last as if I had seen them through tears. My heart beat more violently than the first time. This was after a hearty dinner.

The third time I was more violently acted on than in the two former. Towards the last, I could not avoid, nor indeed felt any wish to avoid, beating the ground with my feet; and after the mouth-piece was removed, I remained for a few seconds motionless, in great extacy.

The fourth time was immediately after breakfast. The few first impressions affected me so little, that I thought Mr. Davy had given me atmospheric air; but soon felt the warmth beginning about my chest, and spreading upward and downward, so that I could feel its progress over my whole frame. My heart did not beat so violently; my sensations were highly pleasurable, not so intense or apparently local, but of more unmingled pleasure than I had ever before experienced.

Detail of Mr. Wedgwood

July 23, I called on Mr. Davy at the Medical Institution, who asked me to breathe some of the nitrous oxide, to which I consented, being rather a sceptic as to its effects, never having seen any person affected. I first breathed about six quarts of air, which proved to be only common atmospheric air, and which consequently produced no effect.

I then had six quarts of the oxide given me in a bag undiluted, and as soon as I had breathed three or four respirations, I felt myself affected and my respiration hurried, which effect increased rapidly until I (*Turn Page*)

GEOLOGY

Helium Gas in Minerals Indicates Great Earth Age

BERYLS, which when clear are used as precious stones, contain different amounts of helium gas, according to the age of the rocks from which they have been obtained. This helium gas is derived from the transmutation of other elements which has been going on extremely slowly ever since the rocks were first formed. Therefore the amount of helium in a given mineral may give a clue to the age of the rock in which it is contained.

Lord Rayleigh, distinguished British physicist, reports in *Nature* that from his latest analyses of beryls containing helium gas, and from his experiments of the rate at which alpha particles or helium atoms are being produced from the element beryllium, it would take about fifty to a hundred billion years for the observed amounts of helium to accumulate in the mineral.

This period of time is much longer than that estimated from the amount of lead derived from the transmutation of radioactive elements in similar rocks, which never indicate an age of more than two billion years.

Since these "chemical clocks" do not quite agree in the age they indicate for the earth's crust, Lord Rayleigh will continue his investigations to find out how their evidence can be reconciled.

became as it were entranced, when I threw the bag from me and kept breathing on furiously with an open mouth and holding my nose with my left hand, having no power to take it away though aware of the ridiculousness of my situation. Though apparently deprived of all voluntary motion, I was sensible of all that passed, and heard every thing that was said; but the most singular sensation I had, I feel it impossible accurately to describe. It was as if all the muscles of the body were put into a violent vibratory motion; I had a very strong inclination to make odd antic motions with my hands and feet. When the first strong sensations went off, I felt as if I were lighter than the atmosphere, and as if I was going to mount to the top of the room. I had a metallic taste left in my mouth, which soon went off.

Before I breathed the air, I felt a good deal fatigued from a very long ride I had had the day before; but after breathing, I lost all sense of fatigue.

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The first physician to write a treatise on occupational diseases was Bernardino Ramazzini, in 1700.

GENERAL SCIENCE

Scientists of Many Countries Gather for Pacific Congress

SCIENTISTS from those countries whose shores are washed by the great Pacific Ocean are meeting these first two weeks of June in the sessions of the Fifth Pacific Science Congress as guests of the Canadian government.

More important than the formal papers which report various aspects of biological and physical research in the east and new world west are the informal chats and meetings which will occur between scientists of different nations and races during the progress of the sessions at Victoria and Vancouver.

The turmoil of the Far East, the conflict in arms and territory between Japan and China, the even more important economic rivalries between commercial groups along nationalistic lines can not be completely ignored in the backs of the minds of the scientists who confer on mutual problems. That is perhaps too much to expect. But in no other field of human activities can politics and economic conditions be more effectively subdued. Scientists working on similar problems, once they have the opportunity to know each other through correspondence and publications, become true internationalists, citizens of the world in the service of humanity. This tendency will be enhanced by the days of personal acquaintance under the favorable auspices of western Canadian hospitality.

These scientists may well establish avenues of common understanding upon problems and racial differences that will aid the statesmen to keep the peace of the world and preserve friendships between the nations.

Thirty-one countries are sending one or more official delegates. The United States has been honored with an allotment of 25 official delegates, while Canada, the host, has 20. Japan has 15.

Dr. H. M. Tory, president of the Canadian National Research Council, is president of the congress' executive committee. Nearly 600 scientists and representative institutions in countries interested in the study of Pacific problems are presenting papers at the fourteen days of sessions which will end on June 14. Many of the scientists will journey to Chicago for the meetings of the American Association for the Advancement of Science beginning June 19 and to see the Century of Progress exposition.

The long distance record in presentation of a paper before the Congress is to be held by Lord Rutherford of Nelson, England's famous physicist, who addressed the first scientific session at Vancouver June 5, speaking over transoceanic radio and long distance telephone from Cambridge, England.

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If such nebulae consist of very small particles, such as atoms of a gas or extremely fine dust, they should redden the light of the stars and appear blue to the observer. In fact, they should be as much bluer than are their neigh-

boring stars, as the sky is bluer than the yellow light of the sun.

On the other hand, if the nebulae consist of large pieces, such as particles of sand or of small stones or meteorites, they should merely dim the light of the stars without making it redder and their own color should be similar to that of the neighboring stars.

A study of the colors of the nebulae should therefore give a clue as to the size of the particles in the nebulae observed. Recent investigations made by Drs. Struve, C. T. Elvey and P. C. Keenan at Yerkes Observatory, have shown that the nebulae are slightly bluer than the stars in their vicinity. But they are not nearly as blue as would be expected if they were composed throughout of very small particles. The astronomers suppose therefore that the nebulae consist of particles of all sizes, but that the proportion of very minute particles is not sufficient to render the light entirely blue.

How many such particles are there in interstellar space? The total amount of gas between the observer and one of the most distant stars investigated is not more than that contained in a cube of air having half an inch on each side. In order to get an idea of the density of this material, imagine that such a cube of air were drawn out in length over a distance, such that light, which travels at the rate of 186,000 miles per second, would require 10,000 years to cover it. The resulting density would be approximately that of interstellar space. The number of larger particles cannot be determined accurately, but there is probably not more than one dust particle in each 15 cubic inches.

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Beautiful phosphorescent light given off by certain sponges living in shallow waters is really due to small worms that inhabit them, according to a discovery just reported by Prof. Emanuel Trojan, of Prague.

The little light-producing worm is scarcely a quarter of an inch long, but can send branches an inch and a half in all directions. Prof. Trojan writes in the London scientific periodical *Nature* how he coaxed the little animal out of its hiding place by attaching the sponge to the edge of an inclined bowl, allowing the water to drip slowly out of the sponge into the bowl. As the sponge became too dry for comfort, the water-loving worms came out.

PHYSICS

American and Dutch Physicists Reach New Low Temperature

Demagnetizing Substance Cooled by Liquid Helium Brings Workers to Quarter of Degree of Absolute Zero

THE GREATEST cold produced and measured by man has now been pushed to within a quarter of a degree of absolute zero, that unattainable heatless point where all motion of the molecules cease and where a gas would exert no pressure whatever.

Two groups of research workers, one at the University of California and the other in Holland, using novel methods identical in principle, have arrived at the extraordinary low temperatures of 0.25 degrees absolute and "certainly below 0.27 degrees absolute," respectively.

The University of California scientists are Drs. W. F. Giauque and D. P. MacDougall, while the Dutch scientists are Prof. W. J. de Haas and E. C. Wiersma of Leyden and Prof. H. A. Kramers of Utrecht. The Americans did their work earlier and published first, and so they now hold the record.

Dr. Heike Kamerlingh Onnes, the pioneer in low temperature research who worked at Leyden, Holland, used the method of lowering temperature by reducing the vapor pressure of liquid helium. He reached a temperature of 0.82 degrees absolute and the same method was used by his successor Dr. W. H. Keesom of Leyden last year to attain 0.71 degrees.

The new low temperature records have been made by taking advantage of the fact that when a substance is magnetized, it heats up. Using liquid helium, made by cooling, liquefying, and solidifying of air, and then liquefying hydrogen to cool the helium, a substance is cooled as low as possible. Then it is magnetized. It heats up. Liquid helium is used to remove that heat. Then it is demagnetized, taking care to keep it heat-insulated. It becomes colder as a result of the demagnetization. Thus lower temperatures than ever before attained have been reached. Technically the method is referred to as "adiabatic demagnetization of paramagnetic salts."

The Americans used a gadolinium sulphate while the Dutch physicists used cerium fluoride as the substance to be cooled.

It is difficult to visualize the low temperature which is now the "farthest south" of temperature. The absolute or Kelvin temperature scale, abbreviated K., has its zero at minus 273.1 degrees on the Centigrade scale or at minus 459.6 degrees on the Fahrenheit scale, the system used generally to designate everyday temperatures.

Near absolute zero strange things happen. Electricity flows almost without hindrance. Substances show their true nature and can be easily studied. That is a reason why scientists strive for such low temperatures.

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PSYCHIATRY

Mental Disease Develops From Early Infancy

ONE TYPE of a common mental disease, schizophrenia, develops very insidiously from early infancy on, members of the American Psychiatric Association were told by Dr. Jacob Kasanin of the Rhode Island State Hospital for Mental Disease.

Working with Dr. Karl M. Bowman of Harvard Medical School and the Boston Psychopathic Hospital, Dr. Kasanin has been studying 151 cases of schizophrenia for over two years.

Constitutional schizophrenia is the name they give to this type which develops in infancy. At a very early age, before the mental disease is recognized, the child is considered by his associates to be queer, different or odd. He doesn't mix well with others. The actual mental disease is largely an exaggeration of this peculiar personality, in the opinion of Drs. Kasanin and Bowman.

The peculiar personality increases as the little patient grows older, gradually and insidiously developing into the mental disease. In this type of case, the psychiatrists found no unusual environmental stress or strain nor any physical disease to account for the disorder.

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NATURE RAMBLINGS
by Frank Thone

BIOLOGY

Diverse Wings

ONLY THREE groups of backboned animals have ever become true fliers: birds, bats and the extinct pterosaurs, or flying reptiles. They all learned to use their forelimbs as flying organs, but they all used them quite differently.

The pterosaurs and the bats hit upon the same general idea, of stretching a sail of skin between the forelimb and the side of the body, sometimes involving the hindlimbs as well. But bats involved all but one of their fingers in the web, saving that one as a clinging and occasionally scratching claw, whereas the flying reptiles kept all but one of their fingers free, depending solely on an enormously elongated little finger to give their skin-sail its extremest extension. It would seem that the bats have the better of the argument, for the elongated fingers stretched down their wing-membranes must certainly make them both stronger in flying and more manageable when folded.

Birds depend on a totally different arrangement. Birds alone have evolved what were apparently originally skin-scales into the enormously extended and complicated and mechanically highly successful structures called feathers. Instead of enormously extending their fingers, as bats and pterosaurs did, they extended their feathers into the stiff-quilled, wide-vaned "primaries" of the wings, keeping the forelimb narrow, reducing the number of fingers and changing them almost beyond recognition as such. There is a web of tissue between forelimb and body, to be sure, but it is almost nothing when compared to the wide sails of the other two fliers.

In birds that have given up the flying habit, the feathers and even the wing-foundation itself have degenerated from flying fitness. Ostriches have plumes wider than those of the eagle or condor, but much weaker. Their very ornamental curliness is a sign of their disuse. In the flightless birds of Australia, this degeneration has been carried still further: the emu has feathers so lax and long that they seem almost like hair, and the little apteryx has no external wings at all!

In flightless or near-flightless birds of other habits, even the size of the degenerated feathers is diminished. The penguin, for example, keeps vigorous wings but uses them as swimming paddles instead of flying organs. Naturally, one cannot get along very well with long fringes on a swimming suit, so the penguin has dispensed with all but the very shortest and closest-fitting feathers, which keep him dry and warm but do not interfere with his movements.

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METEOROLOGY

Ships To Be Asked For Hurricane Data

HURRICANE warnings issued by the U. S. Weather Bureau this year will have the advantage of news direct from the sea areas where these terrific tropical storms are in the making. Under a new plan worked out by E. B. Calvert, chief of the forecast division, ships at sea in regions known or suspected to be brewing hurricanes will receive radio requests from suitably located shore stations for up-to-the-minute data, which will be incorporated into the announcements sent out.

In this work, the Weather Bureau will have the cooperation of the Radiomarine Corporation and the South Puerto Rico Sugar Company.

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BIOGRAPHY

Dr. John Dewey Selected As First of American "Aristoi"

DR. JOHN DEWEY, the philosopher, is the first of America's "Aristoi."

Nine other living American men, judged by a jury of the Aristogenic Association to be greatest in service to mankind, have been selected and their identity will be announced later.

Careful and extensive measurements and records are being made by the Aristogenic Association of the bodies and minds of these ten "Aristoi," Dr. C. Ward Crampton, president of the association, explained in telling of success in obtaining data on Dr. Dewey.

Fifty years ago Dr. J. McKeen Cattell, the pioneer psychologist, made psychological tests on a number of men who later became leaders in their chosen work. Dr. John Dewey was among them, as were W. H. Burnham and G. Stanley Hall. Dr. Cattell has just placed these records at the disposal of the Aristogenic Association.

Since the Aristoi have made their great contributions to humanity in years past, it is sometimes difficult, Dr. Crampton explained, to obtain adequately complete records of their lives, labor, preparation and service. The association is attempting to gather such records as may have been made in the past. They are seeking records of the Aristoi from schools, colleges and libraries but the records have been few and hard to find.

The Aristogenic record consists of careful and extensive measurement of both the physical condition and mental attributes of the individual.

"In addition to anthropological data, X-rays, sound films, handwriting, finger prints, casts of the face and hands, etc.," Dr. Crampton explained, "the association will file other records when available, such as phonograph records of Science Service."

"The Association suggests that records similar to the Aristogenic record might well be instituted in the colleges, and data recorded, first from men of distinction in the Alumni, in the faculty or recipients of honorary degrees. Secondly, abbreviated records to be refreshed each decade might be made of all students. Some of these records might very possibly be needed fifty years hence for the Aristogenic file. All such records will, however, serve as control data and will provide immensely valuable information for the medical and social sciences.

"The Association suggests the propriety of all persons keeping their own life record, for the service they will render to themselves in the guidance of medical care and life management. . . ."

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First Glances at New Books

Additional Reviews On Page 368

Medical Education

FINAL REPORT OF THE COMMISSION ON MEDICAL EDUCATION—Willard C. Rappleye, Director of Study—*Columbia University Press*, 560 p., $2. Medical education in America has progressed far from early Colonial days when the apprentice system was the only method of training new doctors. But only in recent years has there been anything like uniformity in the standards and methods of the various medical schools and only recently has medical education in America equalled that of European countries. The present status of the problem with suggestions for improvement are presented in this lengthy report. The Commission was organized in 1925 by the Association of American Medical Colleges. Dr. A. Lawrence Lowell, former president of Harvard University, was chairman and the membership included sixteen other leaders in medicine and education.

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Psychology

SELF-CONSCIOUSNESS AND ITS TREATMENT—A. A. Roback—*Sci-Art*, 122 p., $1.65. If your fingers become "all thumbs" when you are trying to display your skill, or if you are appalled by the thought of a public audience or a microphone, you will probably be interested in the advice of this psychologist.

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Nursing

A GENERAL HISTORY OF NURSING—Lucy Ridgely Seymer—*Macmillan*, 317 p., $2.75. The present edition was revised for American publication by Nina D. Gage, president of the International Council of Nurses. Here is an ideal graduation gift for the young nurse. However, the book will appeal to a much wider audience than the professional nurses. Those with a practical turn of mind will be glad to find that this history is sufficiently modern to include a discussion of the present problems in the field of nursing.

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General Science

SURPRISES, NATURE AND SCIENCE READERS, BOOK THREE—Edith M. Patch and Harrison E. Howe—*Macmillan*, 307 p., 84c.

THROUGH FOUR SEASONS, NATURE AND SCIENCE READERS, BOOK FOUR—Edith M. Patch and Harrison E. Howe—*Macmillan*, 331 p., 88c. Two books in a new school reader series with science for subject material. The books are attractively produced, with suitable type and numerous pictures. Riddles, science games, and things to do are suggested for the children. The subjects chosen for the reading lessons are such familiar ones as a cotton dress, rocks, maple sap, summer clouds, potatoes. The facts are so presented as to teach the child to observe more keenly the world around him.

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Botany

BOTANY, THE SCIENCE—*Encyclopaedia Britannica, Inc.*, xiii+200 p., 11 pl., $3. Botanical articles from the Fourteenth Edition of the Encyclopaedia Britannica, with many excellent text illustrations in addition to the plates.

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Zoology

FISHES, INSECTS AND REPTILES, THE LOWER VERTEBRATES AND INVERTEBRATES—*Encyclopaedia Britannica, Inc.*, xviii+265 p., 30 pl., $3. A selection of articles from the Fourteenth Edition of the Encyclopaedia Britannica, arranged to form an excellent single-volume reference book on the lower vertebrates and invertebrates.

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Psychology

A PSYCHOLOGY LABORATORY MANUAL—Willard Lee Valentine—*Prentice-Hall*, 285 p., $2. Elementary experiments and demonstrations that have already been used and found to work at Ohio Wesleyan University and Ohio State University. Numerous illustrations and detachable record sheets add to the clearness and convenience of the book.

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Paleontology

VERTEBRATE PALEONTOLOGY—A. S. Romer—*Univ. of Chicago Press*, 491 p., $5. Prof. Romer moves into a field hitherto wholly unoccupied, for there is no modern book covering this subject in English. He thereby earns the gratitude of geologists, paleontologists, zoologists and the educated public generally, for his work is adapted for use either as a text and reference volume or as a book to be read (with chewing and digestion), by information-seekers outside university classes.

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Archaeology-Ethnology

MIDDLE AMERICAN PAPERS—Maurice Ries—*Dept. of Middle American Research, Tulane Univ.*, 566 p., $5. Fifteen contributions by the staff of the Department of Middle American Research and its friends made up this volume, dealing mostly with Mayan problems. The subjects range from revised data on Spanish explorations to Mayan trade and Mayan war and weapons. There are several papers on the Mayan calendar correlations by Hermann Beyer, Juan Martinez Hernandez, and Enrique Juan Palacios; and there is a most interesting article on "Stamping: A Mass-production Printing Method 2000 Years Old."

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Orthopedics-Physical Education

THE DIAGNOSIS AND TREATMENT OF POSTURAL DEFECTS—Winthrop Morgan Phelps and Robert J. H. Kiphuth—*Charles C. Thomas*, 180 p., $4. While this book will be of chief interest and value to physical educators and physicians in charge of detecting and correcting faulty posture, the chapters on environmental influence, normal posture and body mechanics may interest the lay reader, particularly if his interest has already been aroused by having discovered that his own or his child's posture needs correction.

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Anthropology

HISTORY, ETHNOLOGY, AND ANTHROPOLOGY OF THE ALEUT—Waldemar Jochelson—*Carnegie Institution of Washington*, 91 p., 27 figs., cloth $3, paper $2. A continuation of Prof. Jochelson's archaeological report on the Aleutian Islands. His expedition spent two years there in 1909 and 1910, learning how the natives worked and played, what their beliefs were, and much additional information about the islands and the inhabitants.

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Psychology

TALENTS AND TEMPERAMENTS—Angus Macrae—*Appleton*, 211 p., $2. The author, who is head of the vocational guidance department of the National Institute of Industrial Psychology, England, gives, in this new volume of the "Contemporary Library of Psychology," a review of modern techniques in vocational guidance.

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